

Our pronouns themselves: processing reflexive forms of singular they in a maze task

Samantha Gutierrez¹ (sgutierrez@mghihp.edu), Henry Cassel², Daniel Grodner²

MGH Institute of Health Professions¹, Swarthmore College²

The pronoun *they*, has been adopted as a personal pronoun by non-binary individuals [1]. Research suggests that English speakers vary in their acceptance of singular *they* (sg-*they*) with definite (def) antecedents, falling into three clusters: non-innovators, who reject def sg-*they*; innovators, who accept sg-*they* with defs without gender marking, and super-innovators, who accept any use of sg def *they*. Super-innovators are younger, and more familiar with, and more accepting of non-binariness [2]. Super-innovators also process sg-*they* faster than innovators, who are faster than non-innovators. However, all groups of comprehenders appear to experience a persistent processing cost associated with sg-*they* compared to plural *they* [3,4].

There are two possible explanations for this processing cost: (1) Integration difficulty: Sg def antecedents are most frequently referenced with *s/he*, so encountering *they* after such a referent is unexpected. Further, *they* is rarely associated with sg defs (being more typically associated with plurals, generics, and indefs). Both factors may cause increased difficulty when integrating the features of the pronoun with the antecedent. (2) Referential ambiguity: Processing costs may arise because comprehenders are uncertain about who the pronoun refers to. Pronouns like *s/he* and *they* are not restricted to antecedents in the current sentence. In *Carrie said she went dancing, she* can refer to *Carrie* or someone else. This ambiguity doesn't arise with reflexives (as in *Carrie took herself dancing*). Exps 1-2 examined whether eliminating referential ambiguity in this way reduces on-line processing costs for sg-*they*.

We used a web-based Maze task [5] (Fig. 1). Participants read sentences in with reflexive pronouns (Table 1). **Exp 1** (N=80) tested whether the processing issues associated with sg-*they* occur with *themselves* and whether these costs vary for different clusters of speakers. **Exp 2** (N=70) was identical to Exp 1 but used *themselves*. In both Exps, sentences (Table 1) varied across pronoun type (her/himself or *themselves/ves*) and the degree of antecedent match (strong, intermediate, weak), as determined by the gender bias of the proper name (established in a separate survey). In strongly matched sentences, the subject matched the most common antecedent type for each pronoun type (e.g., *Paul...himself, Paul and Jan...themselves/ves*). In intermediate match sentences, the subject was gender equibaised (e.g., *Casey*). In weak match sentences, the subject was the least common antecedent type for the pronoun (eg, *Paul...herself/themselves/ves*). Participants were classified as innovators, non-innovators, and super-innovators based on a survey measuring off-line acceptability judgments of sg-*they* [2].

Accuracy was >98.5% in all conditions so we focus on RT. Sg-*they* was easier to process than gender mismatches. In both Exps 1 and 2 integrating weakly matched *her/himself* was significantly slower than for sg *themselves/ves* (ps<.001). This was true for all 3 clusters of speakers. Relevant to our central question: reflexives did not eliminate the cost of sg-*they*. Sg-*they* was also more difficult to process than pl-*they* (p<.001) regardless of the gender bias of the antecedent. This was true of all clusters, but super-innovators had a smaller sg-*they* penalty than other clusters (interaction effect p < .05). This indicates that there is difficulty integrating sg-*they* with its antecedent. It also suggests that openness to sg-*they* does not eliminate this cost.

In exploratory analyses, *themselves* was read faster than *themselves* (p <.01). This is intriguing because *themselves* morphologically sg and so could ease integration difficulty with a singular referent. Further many individuals judge *themselves* as more acceptable [1]. To explore this issue directly, in Exp 3, (N=60) we compared processing of *themselves* and *themselves*. Participants were classified as themselves or themselves preferers by off-line judgments. Both groups were faster to process *themselves*. This demonstrates that the integrations difficulty with sg-*they* is not made easier by morphological singularity. It is possible that sg *they* is still stabilizing in the grammar so more experience will decrease processing difficult. It is also possible that the relative rarity of def sg *they* relative to other uses of *they* will always cause difficulty. Awareness of such costs will help people provide grace in efforts to make language more inclusive.

Table 1. Example sentences for Experiment 1 and Experiment 2

Pronoun Type	Strong Match	Intermediate Match	Weak Match
S/he	Alice went to the store to buy herself milk.	Casey went to the store to buy herself milk.	Paul went to the store to buy herself milk.
They	Alice and Casey went to the store to buy milk.	Casey went to the store to buy themselves milk.	Paul went to the store to buy themselves milk.

Table 2. Example sentences for Experiment 3

Pronoun Type	Morphological Match	Morphological Mismatch
S/he	Alice went to the store to buy herself milk.	Alice went to the store to buy himself milk.
Plural-they	Alice and Paul went to the store to buy themselves milk.	Alice and Paul went to the store to buy themselves milk.
Singular-they	Alice went to the store to buy themselves milk.	Alice went to the store to buy themselves milk.

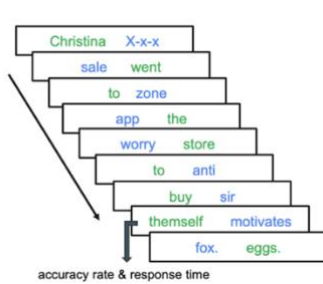
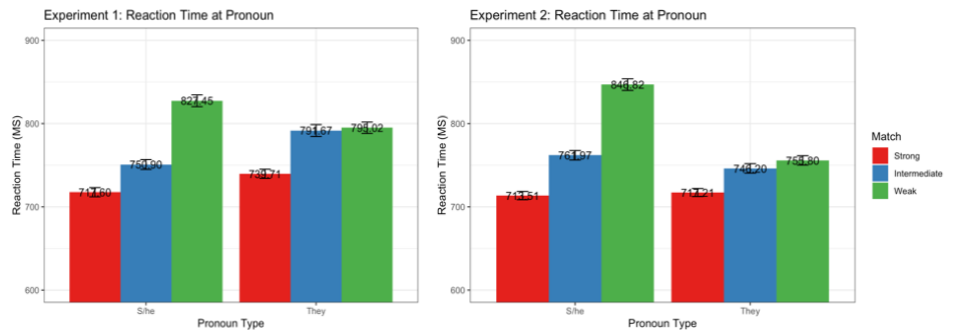
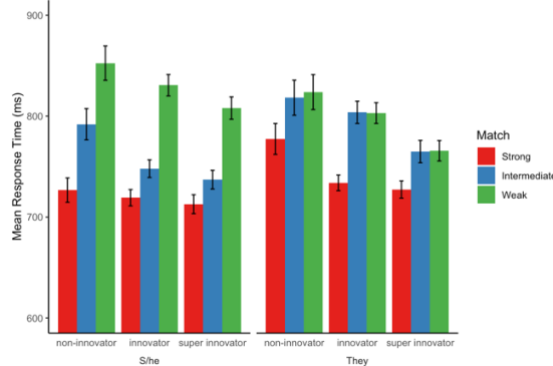


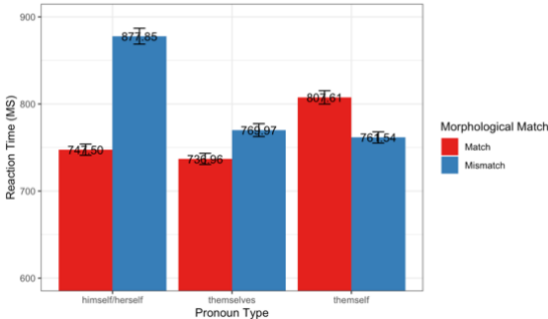
Figure 1: Example of Maze task



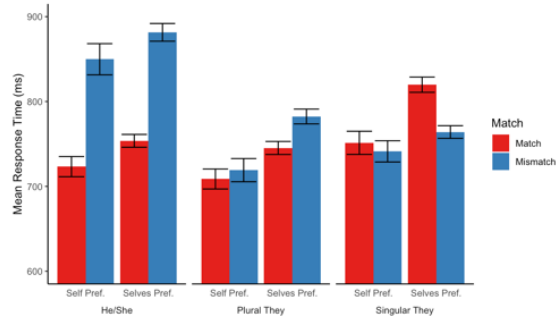
Experiment 1: Mean Reaction Times by Group



Experiment 3: Reaction Time at Pronoun



Experiment 3: Mean Reaction Times by Self/Selves Group



References. [1] Conrod., Schultz, & Ahn. (2022). How many selves for them? *NELS 52*. [2] Camilliere, et al. (2021). *They is Changing. Proceedings of Cog. Sci. Society* [3] Shenkar, et al. (2023) Investigating the processing of singular they using a web-based maze task. Paper at the 2023 HSP [4] Chen et al. (2022) Using ERPs to investigate the processing of singular they. Paper Ex Prag. [5] Boyce, et al. (2020). Maze made easy: Better and easier measurement of incremental processing difficulty. *JML*.